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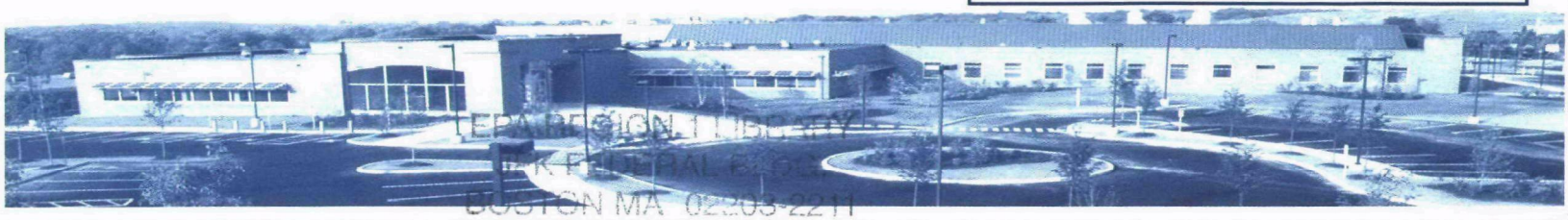
ENVIRONMENTAL SCIENCE FACT SHEET



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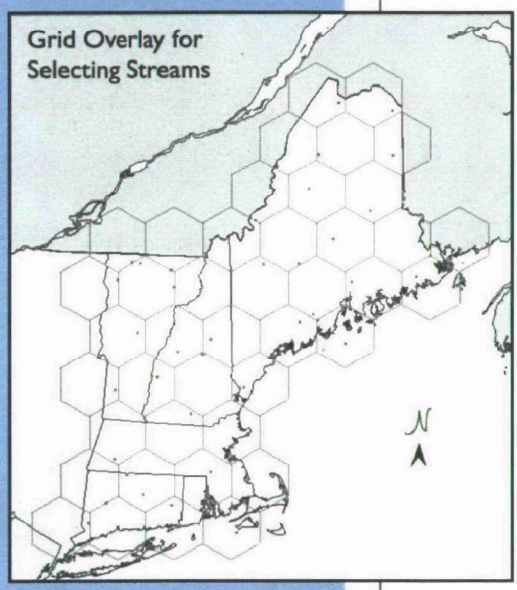

NEW ENGLAND WADEABLE STREAMS PROJECT

INTRODUCTION

The New England Wadeable Streams Project (NEWS) provides assessments of the ecological conditions of streams across the New England region using random probability based sampling methods. This sampling methodology provides uniform spatial coverage across specific geographic areas, such as watersheds, basins, states or regions. This is accomplished by overlaying the sampling area with a hexagonal grid and then randomly selecting stream segments to be sampled within each hexagon using ArcInfo and Geographic Information System (GIS) technology.

ASSESSING ECOLOGICAL HEALTH

Streamlining between states' water body assessments and their subsequent interpretations is a broader goal of the Wadeable Streams project. By developing and refining approaches where uniform interpretations of ecological aquatic health can be made, notwithstanding state boundaries and methods used, regional water body assessments can be similarly made and interpreted. This improves methods, providing a way for reaching the goal of moving towards normalizing water quality assessments nationally, and approaches the goal of fulfilling the original intent of the national water quality inventory.

PARTNERS

This project is a collaborative effort between the EPA New England Regional Laboratory (NERL), the New England Interstate Water Pollution Control Commission (NEIWPCC), EPA Office of Research & Development's Atlantic Ecology Division (AED) in Narragansett, RI, and the New England states. NEIWPCC was awarded a cooperative agreement to support this project. Substantial assistance has been provided by AED in the form of developing a design for probability sampling, GIS and statistical support, and developing future reports. The NERL is leading field efforts, sample protocol development, interstate and state based coordination, technical support and technology transfer and training.

THE NEED FOR DATA

One of the key elements of the project's design is making sure that the right type, quality, and quantity of data are collected, providing useful information for assessments. State and federal regulatory agencies are the primary users of the data. As a result, the structure and design of this program are developed to answer frequently asked questions about their specific water quality

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PARTNERS

- EPA New England Regional Laboratory (NERL)
- New England Interstate Water Pollution Control Commission (NEIWPCC)
- EPA ORD's Atlantic Ecology Division (AED) in Narragansett, RI
- New England States

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EPA United States Environmental Protection Agency New England

901-F-03-004A
July 2003
www.epa.gov/ne/lab

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programs. The types of data collected are based on information needed to address current front line environmental issues and meet long term programmatic needs—for example, reporting water quality. The sampling design and assessment methodologies are targeted to answer the following questions about wadeable streams in the region:

- What proportion of wadeable stream miles statewide or regionally are demonstrating impaired physical habitat/biological/chemical conditions?
- What kinds of stream systems demonstrate the lowest biological diversity?
- What types of areas demonstrate the highest ecological quality?
- What is the relationship between land use and biological condition in the region/states?
- What proportion of stream miles contain X% of native fish species?
- What proportion of stream miles support X% of expected species richness and or macroinvertebrate species richness?

The NEWS Project provides an unbiased approach from which state water quality programs can assess the biological integrity and health of all waters of their state.

Timeline

This project entails designing and implementing biological and chemical monitoring and is taking place over a three year period. Already into the third year, a data report has been completed on 42 stream locations sampled across the New England states in 2001. Years two and three involve the active participation of state agencies. To date, Vermont, New Hampshire, Maine, and Connecticut have been participating as part of the region wide effort. In addition, each of these states has decided to conduct probability-based surveys on an individual statewide scale to augment their existing water quality and biological monitoring programs. Year two monitoring consisted of another 23 randomly selected stations using the same hexagonal grid system. Each year duplicate samples are collected at 10% of these stations for quality assurance purposes. Year three will be dedicated to completing sampling of state level sites, data analysis and writing a final project report. An estimated 70 stations will be monitored regionally during the three year sampling period and a minimum of 50 sites per each individual statewide effort.

Sampling

All sampling locations are sampled for invertebrates, fish, and water chemistry with accompanying assessments of in-stream and riparian habitats. Each monitoring station includes fish and macroinvertebrate population assessments, physical habitat assessments, water chemistry analyses, and characterization of surrounding land uses using GIS technology. Fish sampling is conducted using backpack electrofishing gear. Water chemistry analyses include pH, temperature, DO, TSS, turbidity, nutrients, alkalinity, hardness, TOC, DOC, color, total phosphorus, total mercury, lead, and cadmium. Additionally, pharmaceuticals and personal care products (PPCPs) were monitored at about 40 selected sites during year two, and more may be collected during year three. PPCPs are a class of pollutants discharged from sewage treatment plants and other domestic waste streams, and have recently been identified as a potential problem for aquatic organisms.

Using backpack electrofishing equipment to sample fish.

Summary

The NEWS Project provides an unbiased approach from which state water quality programs can assess the biological integrity and health of all waters of their state, meet the mandates of the Clean Water Act, and augment their traditional targeted monitoring approaches with a sampling design that has proved both cost effective and scientifically sound. The NEWS Project offers opportunities for unique collaborative efforts among state and federal agencies while advancing biological monitoring methods and data interpretation. The end results enhance the state of the science, promote more unified collaborative efforts, and implement comprehensive evaluations of streams across New England.